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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/683,214	12/03/2001	Gary William Yeager	08CN6021-2	5090
23413	7590	06/18/2004	EXAMINER	
CANTOR COLBURN, LLP 55 GRIFFIN ROAD SOUTH BLOOMFIELD, CT 06002			VIJAYAKUMAR, KALLAMBELLA M	
			ART UNIT	PAPER NUMBER
			1751	

DATE MAILED: 06/18/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/683,214

Applicant(s)

YEAGER ET AL

Examiner

Kallambella Vijayakumar

Art Unit

1751

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 April 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-46 is/are pending in the application.
- 4a) Of the above claim(s) 33-46 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4-7,9,13-24 and 27-32 is/are rejected.
- 7) ☒ Claim(s) 3,8,10-12,25 and 26 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 2.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

Detailed Action

- Applicant's election with traverse of Group-I, Claims 1-32, with species in Claims 2-3 from Group-A and claims 15-17 from group-B in the reply filed on 04/09/2004 is acknowledged. The traversal is on the ground(s) that the claims 18-22 need to be added to complete the group, and this is persuasive and accordingly claims 18-22 have been included. The traversal is further on the ground(s) that the limitations of the method claims in 42 within the group-V, is a primary function of its compositional limitations, which are same as those of claim-1, Claims 1-46 read on the elected monomer in Group-B, and that the search for the groups II-IV would not be an undue burden. This is not found persuasive because for the reasons given in paper 03/25/2004. Upon the search and examination of the claims, and the following claims have been rejoined: Species B, Claims 4-5; Species C, Claims 6-8; Species D, Claims 9-10; Species-E, and Claim-11. Claims 1-32 of the elected Group-I are currently being examined. Claims 33-46 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected groups II-VI, there being no allowable generic or linking claim. Claims 1-46 are currently pending with the application.

The requirement is still deemed proper and is therefore made FINAL.

- The listing of references in the specification is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609 A (1) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the examiner on form PTO-892 has cited the

references and/or the applicants have them provided on PTO-1449, they have not been considered.

- The specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
 2. Ascertaining the differences between the prior art and the claims at issue.
 3. Resolving the level of ordinary skill in the pertinent art.
 4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
- Claims 1-2, 4-7, 9, 13-24 and 27-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fan (H521) in view of Boyd et al (US Patent 5,189,116).

Fan teaches the thermoset composition formed by the polymerization of polyarylene polyether resins, particularly end-capped polysulfones, containing phenolic residues and having each of their ends capped with monovalent organo-radical such as methacrylates, and at least one comonomer such as styrene, substituted styrenes, acrylates, methacrylates, acrylonitrile and alkylphthalates, forming new cured resins with toughness, improved electrical properties and glass transition temperatures (Abstract, Col-3, Lines: 8-19; Col-20, Lines: 33-35, Col-5, Lines: 31-52, Col-22, Lines: 28-68, Col-45-46, Table-XIV). Polymerization was carried out by dissolving PSF-VF in styrenes and further mixing with other comonomers such acrylates and methacrylates, acrylonitrile, that would meet the limitation of acrylol monomers in instant claim-1 (Col-40, Tables-VI-VII) and using peroxide or by UV using photosensitizers {claims-28, 29, 30}. Styrenes would meet the limitation of alkenyl aromatic monomer in Claims -1, 15 and 16 (Col-21, Lines: 45-50; Col-22, Lines: 28-68, Col-25, Line-34 to Col-28, Line-3; Claims: 1, 2, 6-10). Additional additives such as thickening agents (Col-28, Lines: 4-11) and reinforcing with glass fiber mat were added into the composite (Col-47, Lines: 61-63). The phenolic residues in the end capped polyether sulfones with the structures given by fan (Abstract, Col-3-5) would meet the limitation of 'Q' in claim-2, and the end cap units would meet the limitation of 'K' in instant claim-2, and the limitation of 'y' in the structure would be an obvious structural parameter. Methacrylates and substituted phenyl amino methacrylates would meet the limitation of Claims 4-6, 18, 19 and 22. Trimethylolpropanetrimethacrylate would meet the limitations of instant claims 20 and 21. Fan teaches the end capping of polyarylene ethers with a variety of end capping agents such as divinyl monomers, esters of aliphatic monocarboxylic acids and

cyanurates; and the determination of amount of end-capping units needed for the application (Col-29, Line: 30 to Col-30, Line-37) and further teach the curing the system by peroxide curing, electron beam curing and photocuring (Col-31, Lines: 12-59) and the use of other curing promoters along with the curing catalyst per the limitation of instant claim 30-31 would have been obvious. The PSF-VR to Styrene ratio given in table-XV (Col-47) would meet the limitation of instant Claim-14. Fan teaches the manipulation of the viscosity of the reaction mixture and that of end-capped polyether sulfones (Col-49, Lines: 34-35) would meet the limitation of instant Claim-13.

Fan does not teach the addition of conductive agents in the composition, although uses fibrous mat for reinforcing.

In the analogous art, Boyd et al teaches the strengthening of the thermosetting bismaleimide resins with carbon fiber, wherein bismaleimide monomers included reaction products of maleic anhydride with polyarylene ether ketones and comonomers such as styrene and acrylates, which are being disclosed in the instant specification and claimed by the applicants in the instant claims. Maleic anhydride would meet the limitation of instant claims 9 and 19 and the use of other acid anhydrides per the limitation of Claim-7. Carbon fiber would inherently meet the limitation of conductive agent in claims 1, 23, 26 and 27. Boyd teaches the use of 30 Wt% bismaleide monomers {polyarelene ethers}, 1-30 wt% low viscosity epoxy, 5-30 wt% particulate {carbon fiber} and 5-50 wt% comonomer {alkylene aromatic monomer/styrene} would met the limitations of instant claims 14, 17 and 27.

It would have been obvious to one of ordinary skill in the art to make modifications to the composition of Fan with the teachings of Boyd by varying the composition to

improve the polymerization process, and, optionally include the carbon fibers in the composition to benefit from improved strength and obviously the electrical conductivity too, because of inherent conductivity of carbon fibers, and because both the teachings are in the analogous art and teach the thermoset compositions comprising polyarylene ethers, and with the expectation of reasonable success in obviously arriving at the limitations of the instant claims by the applicants.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1, 4, 15, 16, 18, 19, 22, 24, 28-29 rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1, 2, 4, 11, 19, 20, and 30 of U.S. Patent No. 6,617,398. Although the conflicting claims are not identical, they are not patentably distinct from each other because they deal with compositions comprising of same polymers and constituents, and the carbon fibrils and nanotubes read on the limitation of conductive fillers in the Claim-1 of the instant application .

Allowable Subject Matter

- Claims 3, 8, 10, 11, 12, 25 and 26 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: The prior art of record neither teaches nor suggestive of 'Q' residuum being a monohydric phenol, the capping groups further containing metal ions, ring-fictionalized polyarylene ethers and the graphite or the carbon fibers with an average diameter of 3.5 to 500 nm per the limitations of the instant claims by the applicants.

Conclusion

- Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kallambella Vijayakumar whose telephone number is 571-272-1324. The examiner can normally be reached on M-Th, 07.00 - 16.30 hrs, Alt. Fri: 07.00-15.30 hrs.
- If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dr. Yogendra Gupta can be reached on 571-272-1316. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.
- Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Kmv
June-12, 2004.


Mark Kopec
Primary Examiner